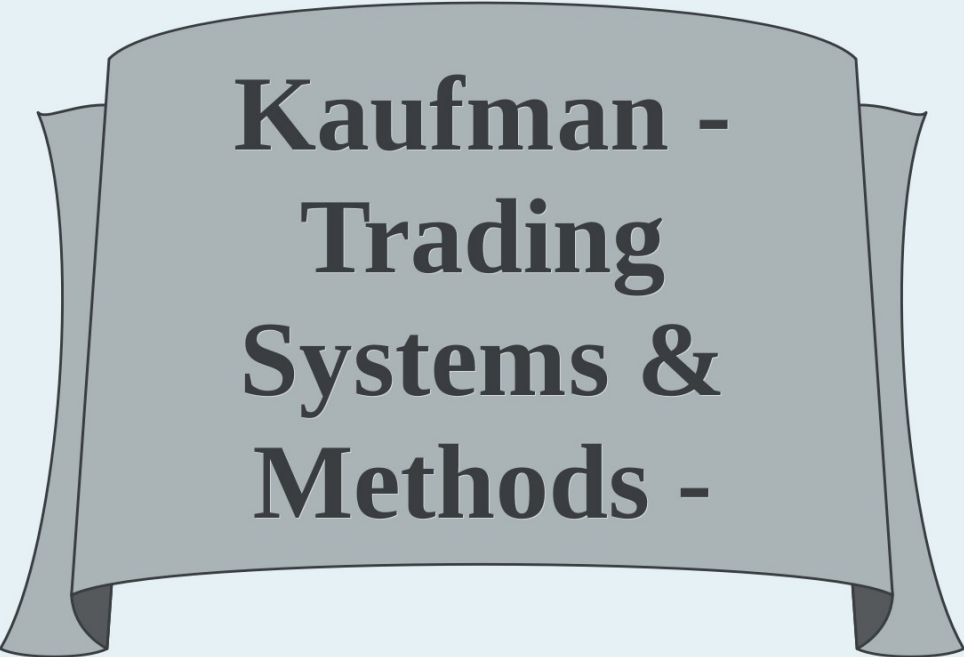




Kaufman - Trading Systems & Methods -

Chap11

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The traditional pointandfigure method calls for the use of a 3box reversal that is. the price must reverse direction by an amount equal to 3 boxes from the most extreme box of the last column before a new column can begin (it actually must fill the Ith box since the extreme box is left blank). The importance of keeping the 3box reversal has long been questioned by experienced pointandfigure traders. it should be noted that the net reversal amount (the box size times the number of boxes in the reversal) is the critical value. For example, a \$4 box for gold with a 3box reversal means that gold must reverse by \$12 to indicate a trend change. The opposite combination, a \$3 box and a 4box reversal, would actually signal a reversal of trend at the same time. The proper selection is based on the subsequent sensitivity of the box size following the reversal. Therefore, a smaller box size may interpret the smallest price movements as a continuation of the trend and ultimately capture more of the price move; it is considered the preferable alternative. The choice of box size and reversal boxes will be considered later in more detail.

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PointandFigure Charting

Pointandfigure charting is credited to Charles Dow, who is said to have used it just prior to the turn of the twentieth century This method differs from ordinary charting in three important ways:

1. it has simple, welldefined trading rules.
2. It eliminates price reversals that are below a minimum (box) value.
3. It has no time factor. As long as prices fail to change direction by the reversal value, the trend is intact.

When pointandfigure charting first appeared, it did not contain the familiar boxes of Xs and Os. The earliest book containing the subject is reported to be *The Game in Wall Street and How to Play it Successfully*, published by Hoyle (not Edmond Hoyle, the English writer) in 1898. The first definitive work on the subject was by Victor de Villiers, who in 1933 published *The Point and Figure Method of Anticipating Stock Price Movement*. De Villiers worked with Owen Taylor to publish and promote a weekly pointandfigure service, maintaining their own charts; he was impressed by the simple scientific methodology. As with many of the original technical systems, the application was intended for the stock market, and the rules required the use of every price change appearing on the ticker. The rationale for a purely technical system has been told many times by now, but an original source is often refreshing. De Villiers said:

"The Method takes for granted:

- 1 . That the price of a stock at any given time is its correct valuation up to the instant of purchase and sales (a) by the consensus of opinion of all buyers and sellers in the world and (b) by the verdict of all the forces governing the laws of supply and demand.
2. That the last price of a stock reflects or crystalizes everything known about or bearing on it from its first sale on the Exchange (or prior), up to that time.
3. That those who know more about it than the observer cannot conceal their future intentions regarding it. Their plans will be revealed in time by the stock's subsequent action.'

The unique aspect of the pointandfigure method is that it ignores the passage of time. Unlike bar charts, you do not make a single vertical mark and then move to the right a uniform distance. Each column of a

pointandfigure chart can represent any length of time The measurement of a significant change in price direction alone determines the pattern of the chart.

The original figure charts were plotted with only dots or with the exact price in each box or with a combination of Xs and occasional digits (usually Os and 5s even, 5 boxes) to

¹Victor DeVilliers, *The Point and Figure Method of Anticipating Stock Price Movements* (Trader Press, New York 1966 (Reprint of 1933 edition), p. 8).

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help keep the chart aligned. A geometric representation was also created by connecting the points in each column with a vertical line and closing the gap between columns with a crossbar on top for a reversal down and a bar at the bottom if the next column goes up. This would later be called a swing chart. Charts using 1, 3, and 5 points were popular, in which each point represented a minimum price move. In the 5point method, no entry was recorded unless the price change spanned 5 points.

Pointandfigure charts, which are still commonly used on the floor of the Chicago Mercantile Exchange and the Chicago Board of Trade, are recorded to show the greatest detail. Each box represents the minimum allowable price move, and reversals of direction use the traditional Icebox criteria. Floor traders use the charts to show only the shortterm sustained price moves and leave a lot to the interpretation of patterns.

PLOTTING PRICES USING THE POINTANDFIGURE METHOD

To plot prices on a pointandfigure chart, start with a piece of graph paper and mark the left scale using a conveniently small price increment. For example, each box may be set at \$ 1 for gold and platinum, oneeighth of a point (4 ticks) for 30year bonds, 1 c for soybeans and silver, and so forth (see Figure 111). The choice of a box size will make the chart more or less sensitive to changes in price direction, as will be seen in later examples. The smaller the price increment, the more changes in direction will be seen. This also corresponds to longer and shorter trends or major and minor trends. Therefore, a pointandfigure chartist looking for a longterm price movement will use a larger box size. Box sizes are often related to the current volatility of the markets.

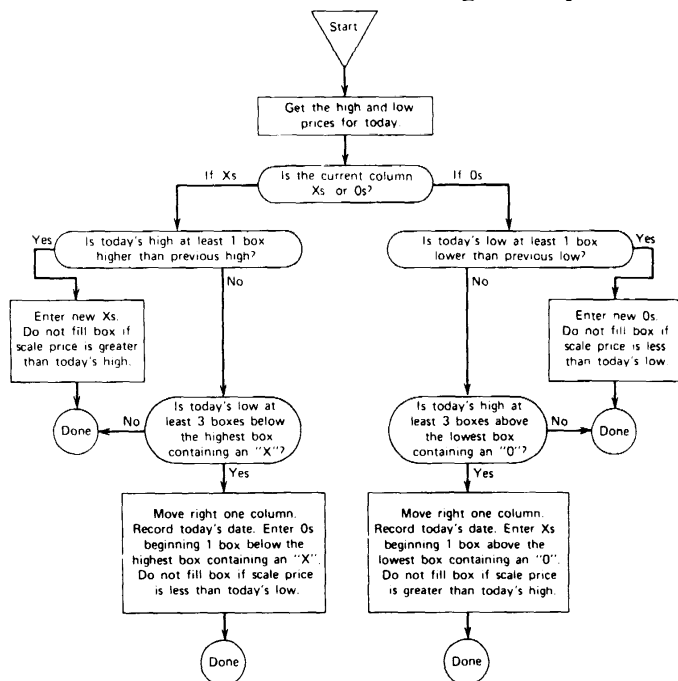
Once the graph paper has been scaled and the prices entered along the left side, the chartist can begin. The first box to be entered is that of the current closing price of the market. If the price of silver is 852.50 and a 1 c box is being used, a mark is placed in the box beside the value 852. An X or an 0 is used to indicate that the current price trend is up or down, respectively. Either an X or 0 may be used to begin after that, it will be determined by the method.

The rules for plotting pointandfigure charts are easily shown as a flowchart (Figure 112). Preference is given to price movements that continue in the direction of the current trend. Therefore, if the trend is up (represented by a column of Xs), the new high price is tested first; if the trend is down, the low price is of greatest importance. The opposite price is checked only if the new price fails to increase the length of the column showing the current trend.

FIGURE 11 1 Pointandfigure chart.

854.0	X																		
853.0	X	O	X																
852.0	X	O	X	O															
851.0		O	X	O	X														
850.0		O		O	X	O													
849.0				O	X	O													
848.0					O	X	O												
847.0					O														
846.0																			

FIGURE 11 2 Pointandfigure daily rules.



The traditional pointandfigure method calls for the use of a 3box reversal that is. the price must reverse direction by an amount equal to 3 boxes from the most extreme box of the last column before a new column can begin (it actually must fill the 1th box since the extreme box is left blank). The importance of keeping the 3box reversal has long been questioned by experienced pointandfigure traders. it should be noted that the net reversal amount (the box size times the number of boxes in the reversal) is the critical value. For example, a \$4 box for gold with a 3box reversal means that gold must reverse by \$12 to indicate a trend change. The opposite combination, a \$3 box and a 4box reversal, would actually signal a reversal of trend at the same time. The proper selection is based on the subsequent sensitivity of the box size following the reversal. Therefore, a smaller box size may interpret the smallest price movements as a

continuation of the trend and ultimately capture more of the price move; it is considered the preferable alternative. The choice of box size and reversal boxes will be considered later in more detail .

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CHART FORMATIONS

It would be impossible for the average speculator to follow the original method of recording every change in price. When applied to stocks, those charts became so lengthy that interpretations similar to those used for the traditional bar chart were necessary to select the best patterns. In 1969, Robert E. Davis published *Profit and Profitability*, a pointandfigure study that detailed eight unique buy and sell signals. The study covered two stocks for the years 1914-1964, and 1, 100 stocks for 1954-1964. The intention was to find specific bull and bear patterns that were more reliable than others. The best buy signal was an ascending triple top, and the best sell signal was the breakout of a triple bottom (Figures 113 and 114).

Plotted daily, futures prices do not offer the variety of formations available in the stock market. The small number of markets and the high correlation of movement between many of the delivery months make the limitations of signal selection impractical. Instead, the most basic approach is used, in which a buy signal occurs when an X in the current column is 1 box above the highest X in the last column of Xs, and the simple sell signal is an O plotted below the lowest O of the last descending column. The variability in the system lies in the size of the box; the smaller the size, the more sensitive the chart will be to price moves. In 1933, Wyckoff noted that it was advisable to use a chart with a different box size when the price of the stock varied substantially.'

Trendlines

The bullish and bearish trendlines important to bar charting also exist for pointandfigure charts. The top or bottom box that remains blank when a reversal occurs often forms the beginning of a descending or ascending pattern at a 45' angle (diagonally through the boxes, providing the graph paper has square boxes). These 45' lines represent the major anticipated trends of the market. Once a top or bottom has been identified, a 45' line can be drawn down from the upper corner of the top boxes of Xs toward the right, or up from the bottom of the lowest box of Os toward the right (Figure 115). These trendlines are used to confirm the direction of price movement and often filter the basic pointandfigure trading signals so that only long positions are taken when the 45' trendline is up and only shorts are entered when the trendline is down.

PointandFigure Studies

In 1970, Charles C. Thiel, Jr., with Robert E. Davis, completed the first purely futures market pointandfigure study³ that calculated profitability of a reasonably large sample of markets

¹Richard D. Wyckoff, *Stock Market Technique*, Number One Wyckoff New York, 1933, p. 89).

³ Charles Thiel and R.E. Davis, *Point and Figure Commodity Trading*, A Computer Evaluation (Dunn & Hargitt, West Lafayette, IN, 1970).

FIGURE 11 3 Best formations from Davis's study.

Ascending Triple Top

```

      X ← BUY
    X X
  X X O X
X O X O X
X O X O
  O

```

Breakout of a Triple Bottom

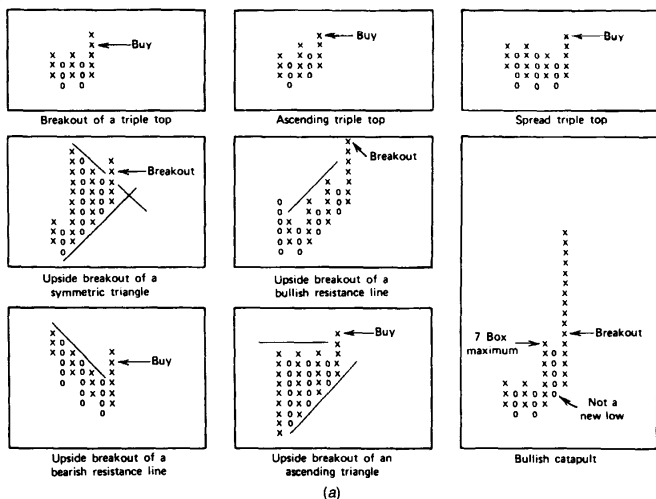
```

      X  X
    O X O X O
    O X O X O
    O   O   O
           O ← SELL

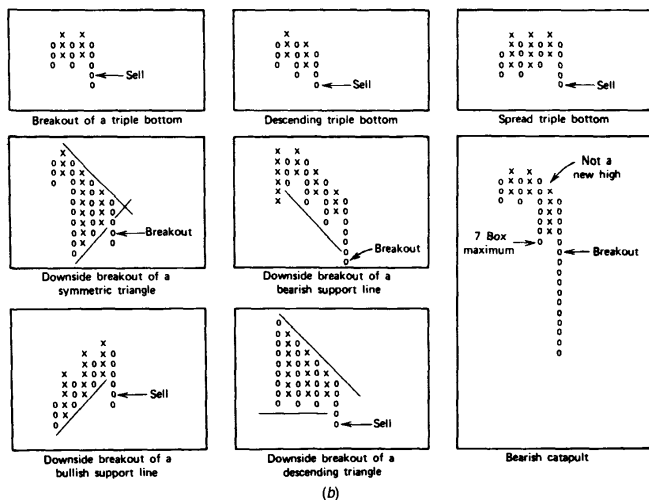
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FIGURE 11 4 (a) Compound pointandfigure buy signals. (b) Compound pointandfigure sell signals.



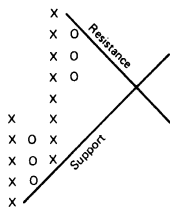
(a)



(b)

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FIGURE 11 5 Pointandfigure trendlines.



by varying both the value of a box and the reversal criteria (the number of boxes necessary to start a new column). With the standard 3box reversal and only simple buy and sell formations, the tests showed 799 signals, of which 53% were profitable; the average net profit on all trades was \$311 realized in approximately 50 days. The period studied was 1960 through 1969. In the mid 1970s, Zieg and Kaufman⁴ performed a computerized study using the same rules but limiting the test period to 6 months ending May 1974, an extremely active market period. For the 22 commodities tested, 375 signals showed 40% of the trades were profitable; the net profit over all the trades was \$306 and the average duration was 12.4 days. It is interesting to note that the most significant difference in the results of the two studies is in the average length of a trade, from 50 to 12.4 days, indicating a change apparently induced by more volatile markets. Although the two tests varied in many of the details, the results are a strong argument for the consistency of the pointandfigure method as a trading tool.

In its current role, pointandfigure differs from other forms of charting because it provides a rigid set of rules for entering long and short positions. Many of the formations are still subjected to interpretation and are frequently used in the original sense by floor traders; but as a tool for the speculator without access to intraday prices and the experience to understand the subtleties of chart analysis, pointandfigure fills an important gap. It will tell the trader exactly what penetration of a resistance or support level is necessary to generate a buy or sell signal and exactly where the stoploss order should be placed to limit risk. It is this welldefined nature of pointandfigure charting that allows computer testing and evaluation.

The basic study of the pointandfigure method involves rules of charting, buy and sell signals, trendlines, geometric formations, and price objectives. Since these points have been covered effectively in at least two books currently available,⁵ they will not be repeated here. More advanced pointandfigure topics will be discussed, including its relationship to bar charting, alternate plotting rules, risklimited trading, and varying box size.

POINTANDFIGURE BOX SIZE

The box size used in a pointandfigure chart determines the sensitivity, or frequency of signals, and allows the identification of trends and trading ranges of various duration. For many years Chartcraft was the only major service that produced a full set of pointandfigure charts (see Table 11.1).

⁴ Kermit C. Zieg, Jr., and Perry J. Kaufman, *Point and Figure Commodity Trading Techniques* (Investors Intelligence, Larchmont, NY, 1975). This book contains complete tabularized results of both pointandfigure tests.

⁵ A.W. Cohen, *How to Use the ThreePoint Reversal Method of Point and Figure Stock Market Trading* (Chartcraft, Larchmont, NY, 1972), and Zieg and Kaufman, *Point and Figure Commodity Trading*

TABLE 11 1 a Point and Figure Box Sizes*

Commodity	Prior to 1975	1975~ Box Year	1975~ Box Size	1977 BOX Size	1977 BOX Size	1986' BOX Size	Size
Grains							
Corn	1971	1/2	2c	20	2c	1	
Oats	1965	1/2	1c	1c		1	
Soybeans	1971		1c	10c	100	5c	5c
Soybean meal pts	1964		50 pts		500 pts	500	
Soybean oil pts	100 pts	1965		10 pts	20 pts		20
Wheat	10 pts						
	1964	1c	2c	2c	2c	1c	
Livestock and Meats							
Cattle pts	1967	20 pts	20 pts	20			
Hogs pts	20 pts						
	1968	20 pts	20 pts	20			
Pork bellies pts	20 pts						
	1965		20 pts	20 pts	20		
	20 pts						
Other Agricultural Products							
Cocoa pts	1964	20 pts	100 pts	100 pts		50	
Coffee pts	10 pts	(20) pts	100 pts	100 pts		50	
	100 pts						
Cotton		(20) pts	100 pts	100 pts		50 pts	
Lumber pts		100) pts	100 pts	100 pts		100	
Orange juice pts		1968	20 pts	20 pts	100		
	100 pts						
Sugar pts	1965	5 pts	20 pts	20 pts		20	
	10 pts						
Metals							
Aluminum				50 pts			
Copper 50 pts	1964	20 pts	100 pts		100 pts		
	50 pts						
Gold		50 pts		100 pts		400 pts	
Palladium				100 pts			
Platinum	1968	200 pts	100 pts		200 pts		
	200 pts	400 pts					
Silver	1971	100 pts	200 pts		200 pts		
	400 pts	1000 pts					

* All box sizes use a 3box reversal and are in points (decimal fractions treated as whole numbers) unless otherwise indicated. t Cohen (1972); parentheses indicate approximate values. Courtesy of Chartcraft Commodity Service, Chartcraft, Inc., Larchmont, NY Chart Analysis Limited, Bishopgate, London. Values are for longterm continuation charts. Cocoa contract changed from cents/pound to dollars/ton.

Over the past 10 years, all markets have had one or more major price moves reaching levels often greater than twice their normal price. Sugar and silver each topped at 10 times their starting value. These moves necessitate changes in box size to control the impact of the increased, and later decreased, volatility.

Alternating with extremely high prices are periods in which many commodities fall to levels near their production costs. Table 11 shows part of the history of changing box sizes based on a 3box reversal, for agricultural markets during the late 1960s compared with the mid1980s. By noting the historic price moves, the change in volatility can be related to the change in box size. Whereas most agricultural markets show a pattern of small to large to small box sizes, coffee and orange juice have remained volatile. Silver and gold maintain large box sizes through the mid1980s, as a result of their long steady

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TABLE 11 1 b PointandFigure Box Sizes

Commodity	1986 Box Size	Commodity	1986 Box Size
<i>Oils</i>		<i>Currencies</i>	
Crude	10 pts	British pound	50 pts
Gasoline	50 pts	Canadian dollar	10 pts
Heating oil	50 pts	Japanese yen	10 pts
		Swiss franc	10 pts
		Deutschemark	10 pts
<i>Financials</i>		<i>Index</i>	
Eurodollars	10 pts	S&P 500	50 pts
GNMAs	$\frac{1}{32}$ pts	Major market	50 pts
Treasury bonds	$\frac{1}{32}$ pts	NYSE	50 pts
Treasure bills	10 pts	Value line	50 pts
Certificates of deposit	10 pts		

declines; however, current levels would require a reduction. Rules for varying box sizes and risks associated with these changes will be discussed in the next sections.

The Nature of Markets

Financial markets have underlying differences from agricultural ones. interest rates have the greatest similarity, with the exception that a low volatility level for rates is associated with high prices. To create a pointandfigure chart for Eurodollars with the same orientation as soybeans, it is necessary to plot the yield, rather than the price, of the market. This is easy for any 3month rate, because the current price can be subtracted from 100; for longer maturity bonds this is more difficult, but could be estimated by subtracting the current price from 164, or by dividing 800 by the futures price.

Currencies present another unique problem, because there is no low or high price for foreign exchange, only what the market decides. When an economy strengthens, the value of the currency increases; when the economy falters, its currency devalues. Sometimes, as happened in the U.S. from 1985 to 1995, the government may choose to allow the currency to decline as a way to reduce its debt. Does this mean that the U.S. dollar is low and that its volatility will decline? No. With agricultural products, when prices fall to production levels there is less trading and lower

volatility, the result of lack of interest. The dollar, however, can continue to decline and its volatility can increase as long as traders believe that the current situation is changing. Therefore, the volatility of a currency is low when market participants see its price as correct, at equilibrium. If prices move away from equilibrium, and the government disapproves of what is happening, economic policy will attempt to move it back., therefore, currency prices can be volatile when they move in either direction away from equilibrium. This makes it difficult to scale prices by a percentage, as we will do in later sections.

THE PROBLEM OF RISK

I go long or short as close as I can to the danger point, and if the danger becomes real I close out and take a small loss.

Jesse Livermore to Richard Wyckoff

Wyckoff Stock Market Technique, Number One Wyckoff New York, 1933, p. 2).

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If the point-and-figure method is accepted as successful, why is it necessary to modify the basic signal and use trendlines and geometric formations to interpret new signals? The answer involves the risk of an individual trade. The difference in treatment of the same price move can be seen by looking at both a bar chart and a corresponding point-and-figure chart for the same period (Figure 116). The most basic bar chart trading method uses horizontal support and resistance trendlines to define a rectangular trading range., when the resistance line is penetrated, a long position is taken. A stoploss is placed below the resistance line to close out the position in the event of a false breakout. An alternate place for the stoploss could have been below the support line allowing the new bull move some latitude to develop. The interpreted bar chart makes the selection of the entry point and the placement of stops seem obvious. However, when trading, the placement of the support and resistance lines is not as clear. The time to enter a trade after a breakout is never certain, and the position for the stop depends on the volatility of prices and the risk that can be assumed.

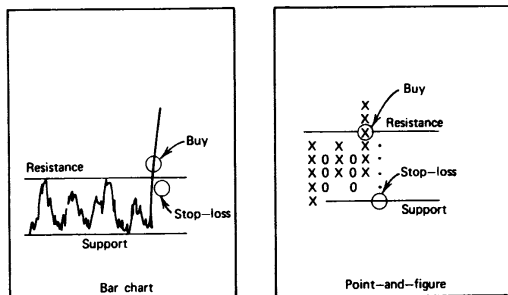
In contrast to the ambiguity of the bar chart, the point-and-figure method defines the support and resistance levels exactly, establishes a place to buy in advance, and designates the position for the stoploss below the rectangular congestion area. The rigidity of the method allows only one place for the stoploss and fixes the risk as the difference between the support and resistance lines, a total of 5 boxes in this example. In the bar chart, the risk might have been held to the equivalent of 2 boxes using the first strategy; however, a very small risk often results in being stopped out of the trend prematurely.

TRADING TECHNIQUES

There are alternate methods for selecting point-and-figure entry and exit points that have become popular. Buying or selling on a pullback after an initial point-and-figure signal is one of the more common modifications to the system, because it can limit risk to any level and still maintain a logical stoploss point. Of course, the smaller the risk, the fewer the opportunities and the more likely you will be stopped out. There are two approaches that are recommended for entering on limited risk:

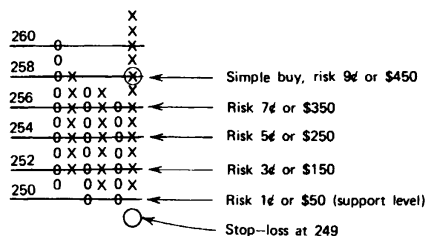
1. Wait for a reversal back to within an acceptable risk, then buy or sell immediately with the normal point and figure stop. Figure 117 shows various levels of risk using corn (a 5,000 bushel contract, with \$ 50 for each 10 move). The initial buy signal is at 258, with the simple sell signal for liquidation at 249, giving a risk of 90, or

FIGURE 11 6 Placement of stops.



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FIGURE 11 7 Entering on a pullback.

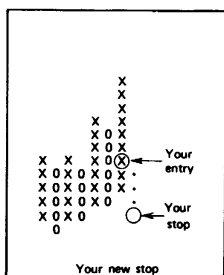
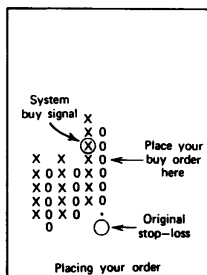


\$450 per contract. Wait for a reversal following the breakout, and buy when the low for the day penetrates the box corresponding to the predetermined risk. Buying into a declining market assumes that the support level will hold, preventing the stoploss point from being reached. Because of this, the base of the formation should be as broad as possible. The test of a triple bottom or a spread triple bottom after a buy signal is a more reasonable place to go long than a simple buy after a small reversal in the middle of a move.

It is not advisable to reduce risk by entering on the simple buy signal and placing a stoploss at the point of the first reversal (3 boxes below the highs). The advantage of waiting for the pullback is that it uses the logical support level as a stop. A stoploss placed nearby following a breakout has no logical basis and will quickly result in a losing trade

2. Enter the market on the second reversal back in the direction of the original signal. As shown in Figure 118, the first reversal following a signal may not be within the desirable risk, but by placing a trailing entry order using the point and figure reversal value, while prices are moving counter to the direction of the signal, an entry will occur on a confirmation of the original direction with a stoploss at the minimum 4box distance.

FIGURE 118 Entering on a confirmation of a new trend after a pullback



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This technique is frequently used by traders who firmly believe that a reversal follows immediately after a breakout and prevents both high risk and false signals. If the pullback that follows the breakout continues in an adverse direction, penetrates the other support or resistance level, and triggers the original system stoploss, no entry occurs, thus saving a substantial whipsaw loss.

The reversal principle in step 2 can also be effective for building positions. In bar charting, a pullback to a bullish support line or a bearish resistance line was a point for adding to a position with a risk limited to penetration of the major trendline. The equivalent procedure using pointandfigure is to add on each reversal back in the direction of the trend using the newly formed stoploss point to exit the entire position as shown in Figure 119.

3. Allowing for irregular patterns. Price patterns are not always as orderly as we want them to be, and the price activity at time of a trend change can be very indecisive. One basic trading principle demands that the market confirms a new high before buying; the first new high might simply be an erratic sideways pattern, or an expanding formation after a period of low volatility. If we require prices to make a new high by more than 1 box on the next upward thrust, and increase the minimum by another box on the third upward thrust, we can actually demand that the momentum increase before a position is set.

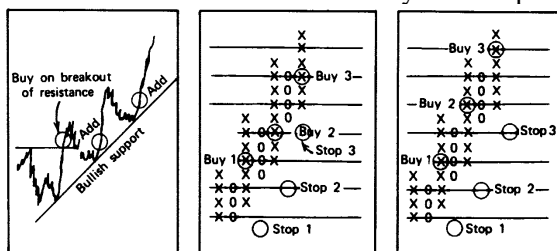
This technique, which tends to minimize false breakouts, may be modified to increase the confirmation threshold from 2 to 3 or 4 boxes as market volatility increases. If the box size is changed according to volatility, as discussed later in this chapter, confirmation can remain at 2 boxes.

Take It and Run!

There comes a time in most substantial moves when there is ample profit and apprehension about how much of the paper profit will be returned before the system closeout signal is reached. Some traders prefer to take the profits. These are decisions that go beyond the area of technical analysis. If the profit currently held in open positions is enough to sustain a life of leisure, a home in the mountains or South Seas, a country club, and a small investment in a hotel or restaurant to occupy your time, then take it and run! A trading sys

'Adam Hewison, "The Will Rogers Theory of Point & Figure Trading," TecAmical Analysis of Stocks

FIGURE 11 9 Three ways to compound positions.



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tem should not depend on a single, very large profit, to work over time. It should have a successful, consistent profile. We can, therefore, reason that any extremely large profit is a windfall and should be taken.

If you cannot sleep nights because you need money to meet personal commitments, you have just the right amount in unrealized profits, and 1 or 2 adverse days would ruin the opportunity, take the profits and begin again with a small investment. Technically, that is an issue of investor risk preference. If you want a logical place to cash in on current open profits but you have some time and latitude, as long as you do not lose more than 10 to 25% of the existing profits, use the pointandfigure reversal value. The reversal value, the box size times the number of boxes in a reversal (usually three), is meant to indicate a significant contrary move and can be used as an objective indication of a change of direction. One approach to taking profits is shown in Figure 1110.

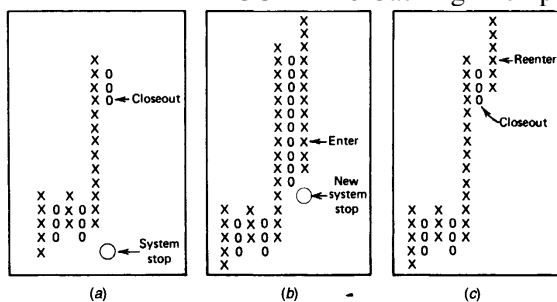
In Figure 1110a, a trailing 3box reversal value is used for the stoploss once there is a sustained move of at least 10 boxes. To reenter the move in the same direction, the same technique is used (Figure 1110b), adding another 4 boxes of profits while keeping the new risk small. In Figure 11 10c, this method lost 4 boxes of the potential profits when the reversal was shortlived.

in general, taking small profits in this way does not improve profits, because it most often misses the biggest moves. it may, however, reduce the risk of loss at a rate even faster than the reduction in profits, yielding a better rewardtorisk ratio. A new rule should be carefully tested to know its effect on different market conditions. If successful, it should always be used. Selective use is more likely to limit potential profits without reducing losses. This topic is covered thoroughly in Chapter 21 ("Testing").

Alternate Treatment of Reversals

Traditional pointandfigure charting favors the continuing trend. On highly volatile days, or outside days, it is possible for both a trend continuation and a reversal to occur. Pointand figure rules require that the trend continuation be recorded and the reversal ignored Figure 11 11 shows a comparison of the two choices. In the example, prices are in an uptrend when a new 1box high and a 3box reversal both occur on day 6. In Figure 11 1 1b, the traditional approach is taken, resulting in a continuous upward trend with a stoploss at 790. Taking the reversal first as an alternate rule, Figure 11 1 1c shows the same trend with a stoploss at 805.

FIGURE 110 Cashing in on profits.



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FIGURE 11 11 Alternate methods of plotting pointandfigure reversals. (a) Sample prices for plotting. (b) Traditional method. (c) Alternate rule taken on day 6.

Day	High	Low
1	802	790
2	811	795
3	813	792
4	818	796
5	825	810
6	832	808
7	840	825

(a)

840	X			X
835	X			X
830	X			X
825	X			X
820	X		X	O
815	X		X	O
810	X	X	X	O
805	X	O	X	O
800	X	O	X	O
795	X	O	X	O
790	X		X	

(b)

(c)

Plotting the reversal first will usually work to the benefit of the trader: both the stoploss and change of trend will occur sooner. Subsequent computer testing proved this to be true. The alternate rule will not help when the reversal value is small and the optional reversals, or outside days, occur frequently.

PRICE OBJECTIVES

Pointandfigure charting has two unique methods for calculating price objectives: horizontal and vertical counts. These techniques do not eliminate the use of the standard bar charting objectives, such as support and resistance levels, which apply here as well.

The Horizontal Count

The time that prices spend in a consolidation area is considered important in determining its potential move. One technique for calculating price objectives is to measure the width of the consolidation (the number of columns) and project the same measurement up or down as the target of the move. The pointandfigure horizontal count method is a more exact approach to the same idea.

The upside price objective is calculated as

$$H_i = P_i + (W \times R)$$

where H_i is the upside horizontal count price objective

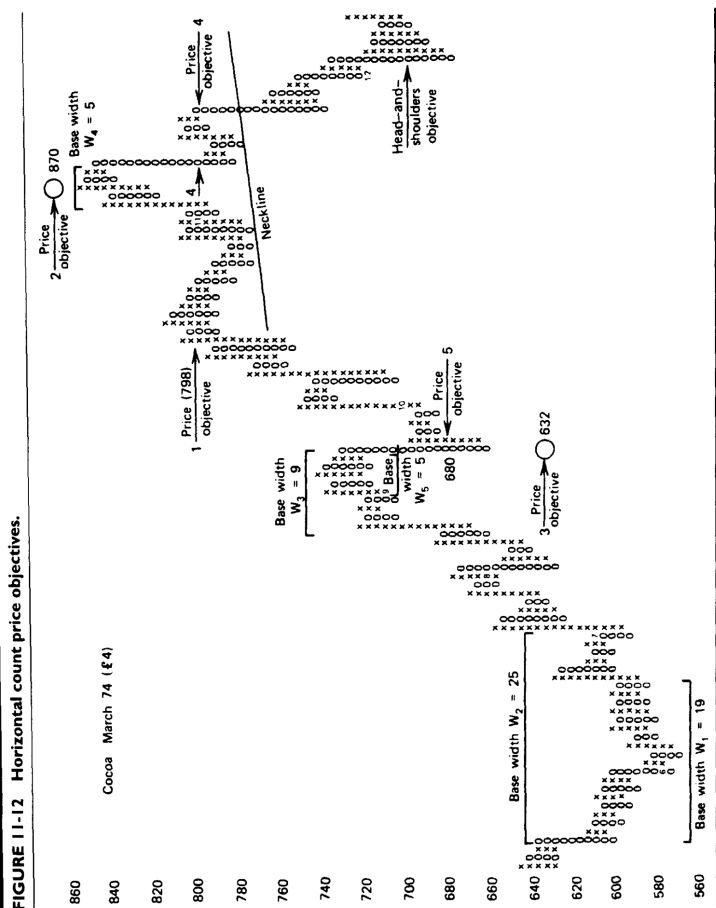
P_i is the price of the lowest box of the base

W is the width of the bottom formation (number of columns)

R is the reversal value (number of boxes times the value of one box)

To complete this formula, the base (width of the bottom or top formation) needs to be identified. Count the number of columns, W not including the breakout column and multiply width by the value of a minimum reversal, R ; then add that result to the bottom point of the base to get the upper price objective. The base can always be identified after the breakout has occurred. For example, Figure 1112 shows the March i contract of London Cocoa

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(£4 box) forming a very long but clear base. The reversal value is £12, and the base is 19 columns (not counting the last column, which included the base). From the lowest point of the base (£570) this gives an objective of £798, reached at the end of the topping formation. Another alternative is the wider base, marked by the dashed line. This selection results in a price objective of £870, by adding $25 \times £12 = £300$ to the lowest point of the base.

The downside objective is calculated in the same manner as the upside objective.

$$H_D = P_H - (W \times R)$$

where H_D is the downside horizontal count price objective
 P_H is the price of the highest box of the top formation
 W is the width of the top formation (number of columns)
 R is the reversal value

Some examples are given for downside objectives in Figure 11-12. A small correction top could be isolated at the £776 price. Widths, W_3 and W_5 , could be chosen. W_3 , the broader top, has a downside objective of £632. W_5 has a smaller width of 5 and a downside objective of £696. The lesser objective, calculated from W_5 , is easy to reach because it coincides with a strong intermediate support level.

The very top formation was small and only produced a nearby price objective similar to the first downside example., there would be no indication that prices were ready for a major reversal. The top also forms a clear headandshoulders pattern, which could be used in the same manner as in bar charting to find an objective. The height of the top of the head to the point on the neckline directly below is 20 boxes; the downside price objective is 20 boxes below the point where the neckline was penetrated by the breakout of the right shoulder, at £776, giving £696 as an objective.

The horizontal count can also be applied to a breakout from a triangular formation, similar to the one on the very far right in Figure 11-12 (marked "Headandshoulders objective"). The width of the formation, W , is the widest point in the center of the triangle, and the upward objective is also measured from the center, rather than from the bottom of the triangle.

The Vertical Count

The vertical count is a simpler and more definitive calculation than the horizontal count. As with the horizontal count, there is adequate time to identify the formations and establish a price objective before it is reached. The vertical count is a measure of volatility; the amount of rebound from a top or bottom, and can be used to determine the size of a retracement after a major price move. To calculate the upside vertical count price objective, locate the first reversal column after a bottom. To do this, a bottom must be established with one or more tests or a major resistance line must be broken. The vertical count price objective is then calculated:

V_{up} = lowest box + (number of boxes in first reversal

× minimum number of boxes in a chart reversal)

The downside vertical count price objective is just the opposite:

V_{down} = highest box – (number of boxes in the first reversal

× minimum number of boxes in a chart reversal)

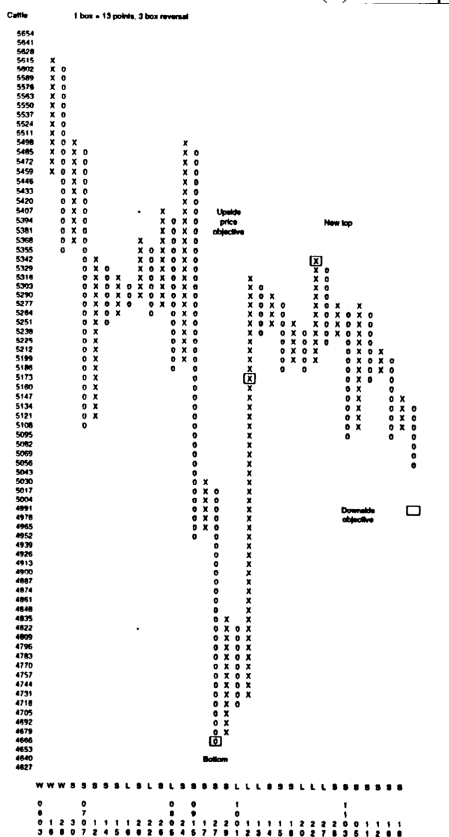
Examples illustrating the vertical count are easy to find. Consider the following cases:

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1. A cattle chart (Figure 1113a) has an obvious bottom at 36.66 and a 13box reversal immediately following. Using the vertical count, a retracement of three times the primary reversal (13 boxes) is added to the low of the bottom. The price objective is then 41.73, 39 boxes above the low.

2. Following that upward move in cattle, there is a top of 43.42 followed by a downward column of 9 boxes. The price objective becomes 27 boxes below the high, or

FIGURE 11 13 (a) Cattle pointandfigure chart.



(a)

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represented by a wide range of indices, has continued to gain and expand in dollar volatility throughout the early 1990s.

In 1969, sugar prices were plotted on a 5point scale while prices ranged from 2.86C to 3.95c per pound; the possible span of pointandfigure boxes that could be filled was 22. In 1973, sugar prices went to almost 600 per pound, approximately 20 times their 1969 price. The daily limits were expanded from Y20 to 2c more than the price had moved in 1 year. The use of a 50 pointandfigure box would result in a new reversal column on any day the market failed to continue its prior direction, and it no longer served the function of smoothing the price movement. it took 1,200 boxes (10 feet of graph paper) to record the moves all the way up to 600.

One reason why the sugar scale changed from 50 to 200 boxes or soybeans from 1c to 100 was the practical need to fit the pointandfigure chart on a single page. Oddly enough, rescaling to fit a piece of paper of constant size has considerable merit. Look at soybeans in 1970. The range of the January 71 futures contract was 25 1 5/8 to 315 and required a page of graph paper with only 64 boxes and an assigned value of 1 c per box. Table 112a shows what happens if the same number of boxes is used each year and if the scale is changed to accommodate the full price range. The reversal value is forced to increase so that the size of the pointandfigure chart and formations will look the same regardless of the price level. This is called keeping the sensitivity constant. The pointandfigure method, with its increased reversal value due to larger box size, will generate about the same number of reversals and buy and sell signals at any price level. Had prices increased without the box size increasing, the system would have had more frequent reversals, as in the sugar example, and it would be considered more sensitive to price changes. Table 112b shows the comparable scaling for the S&P 500 from 1988 (after the "crash") through 1996. During this period, the stock index had an equal number of years with slightly higher volatility, as well as years with as much as 50% lower volatility. During the quieter years there would have been very few trading signals.

The relationship of reversal value to the average price for soybeans from 1971 through 1977, and the S&P from 1988 through 1996 gives a pricevolatility relationship, shown in the last column of Table 112a. It is important to know to what degree prices will fluctuate as they advance and decline. This can become a valuable risk management tool.

Before continuing, certain questions must be asked of this method: Why were soybeans started with a 10 box ... why not V20 or 5c? Does this pricevolatility relationship represent the best approach to rescaling? How can it be used?

It can only be assumed that the original selection of a 10 box for soybeans was a combination of both a smoothing attempt (chosen as a multiple of the minimum move) and convenience. The convenience part is easy to see; all the box sizes in Table 111 were even numbers. The first pointandfigure charts were drawn using the smallest allowable move and later refined to larger increments to identify longterm trends, and major

support and resistance levels. However, it is necessary to find a more logical selection of starting parameters.

To answer the second question, the impact of rescaling on trading must be considered. As prices rise, boxes become larger and the minimum risk becomes proportionately greater.

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TABLE 11 2 Keeping the Size of the Chart the Same

(a) Soybeans (January Futures Contract)

Year	High	Low	Average	Box Size	Reversal	Total Number of Boxes	Reversal Value	Reversal as Percentage of Average %
1971	315	251	283	1.00	3	64	3.00	1.06
1972	346	282	314	1.00	3	64	3.00	0.96
1973	444	300	372	2.25	3	64	6.75	1.81
1974	915	349	632	8.84	3	64	26.53	4.20
1975	961	509	735	7.06	3	64	21.19	2.88
1976	705	439	572	4.16	3	64	12.47	2.18
1977	782	490	636	4.56	3	64	13.69	2.15

(b) S&P 500 Futures (Continuous Daily Prices)

1986	250	205	228	0.70	3	64	2.11	0.93
1987	330	175	253	2.42	3	64	7.27	2.88
1988	280	240	260	0.63	3	64	1.88	0.72
1989	350	280	315	1.09	3	64	3.28	1.04
1990	365	285	325	1.25	3	64	3.75	1.15
1991	410	310	360	1.56	3	64	4.69	1.30
1992	440	390	415	0.78	3	64	2.34	0.56
1993	470	425	448	0.70	3	64	2.11	0.47
1994	480	435	458	0.70	3	64	2.11	0.46
1995	610	460	535	2.34	3	64	7.03	1.31
1996	745	600	673	2.27	3	64	6.80	1.01

The risk of trading one contract increases at the same rate as the volatility expressed as a percentage of average price. If the box sizes are not increased when prices rise, risk can be kept small, but frequent losses will occur and trading will be based on extremely shortterm trends.

There are few alternatives to rescaling, the two most reasonable being:

Method 1Rechart at new price levels using larger box values to keep the size of the chart constant and the sensitivity fixed as shown in Table 112.

Method 2Increase the box value at a rate based on a fixed percentage of the current price so that a chart with a box value of 3 points at a price of 300 (1% value) would have a 6point box at a price of 600.

Both approaches effectively increase the box value and risk while reducing the sensitivity of the chart as prices increase.

Solving the Scaling Problem

To avoid being arbitrary in selecting a pricevolatility scaling relationship, we perform a regression analysis on the average price and box size to get a formula for the relationship. A linear approximation was performed using the soybean values in Table 112a, based on a 3box reversal, with the following results:

100 X volatility = 28.8 +.485 x average price

box size = 3.347 +.0147 x price

The exact figures for the box size corresponding to specific price

levels are shown in Table 113. Understanding that box sizes must be in practical increments, a variable box point

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and figure chart can be constructed that changes box size as the price increases according to the table. These box sizes are shown with their corresponding price levels in Table 114.

Scaling by Constant Rate

The second choice of scaling requires answering the question: "Why were soybeans started with a 10 box?" The longterm charts show that prior to 1970, prices were relatively stable and fluctuated in normal ranges. Finding the proper box size for the initial interval forms the basis for continuing into more volatile years. In the 1970 study by Thiel and Davis entitled Point and Figure Commodity Trading.. A Computer Evaluation (Dunn & Hargitt), they approach the problem of variable box size and reversal value strictly scientifically. They proceeded to test a good sampling of commodity futures markets, varying both the box size and reversal value, and recorded the resulting profits or losses and the reliability of the combination (percentage of profitable trades). For example, the January 66 soybean contract test results are presented in Table 115.

TABLE 11-3 Point-and-Figure Price-Volatility Relationship (Method 1)

Average price	250	300	350	400	450	500	550	600
Percentage volatility	92	117	140	165	189	214	240	262
Box size	.328	1.06	1.80	2.54	3.20	4.01	4.75	5.49
Average price	650	700	750	800	850	900	950	1000
Percentage volatility	286	311	335	359	383	408	432	456
Box size	6.22	6.96	7.70	8.43	9.17	9.91	10.65	11.38

TABLE 11-4 Point-and-Figure Variable Box Size for Specific Price Levels (Method 1)

Box	Price	Box	Price	Box	Price	Box	Price	Box	Price
1/4	245	2 1/4	380	4 1/4	516	6 1/4	652	8 1/4	787
1/2	262	2 1/2	397	4 1/2	533	6 1/2	669	8 1/2	804
3/4	279	2 3/4	414	4 3/4	550	6 3/4	686	8 3/4	821
1	295	3	431	5	567	7	703	9	838
1 1/4	312	3 1/4	448	5 1/4	584	7 1/4	720	9 1/4	855
1 1/2	329	3 1/2	465	5 1/2	601	7 1/2	736	9 1/2	872
1 3/4	346	3 3/4	482	5 3/4	618	7 3/4	753	9 3/4	889
2	363	4	499	6	634	8	770	10	906

TABLE 11-5 Thiel and Davis's Results, January 66 Soybeans

Box Size	Reversal Boxes	Results		
		Profitability	Profit	Per Trade
0.500	4	2 of 12	-14.874	-1.239
0.500	5	2 of 12	-14.874	-1.239
0.500	6	2 of 10	-15.124	-1.512
:	:	:	:	:
1.000	4	1 of 2	3.00	1.500
:	:	:	:	:
4.000	1	1 of 1	7.25	7.25
:	:	:	:	:

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The study included the years 1960-1969, with data supplied by Dunn and Hargitt. This coincides exactly with the time interval needed to determine the basic box size and reversal. In their study, Thiel and Davis draw conclusions and present alternatives for their selections, but the interests of this analysis are slightly different. Table 116 shows the final

choice. The most important part of Table 116 is the reversal value, expressed as a percentage of the 10year fluctuation. This figure represents the best choice of value for rescaling as a fixed percentage of the market's average price. The proper reversal criteria for each price level can now be selected using the rate of increase shown in the first and second formulas and the base price from Table 116.

For convenience, all box sizes will be chosen to correspond to the standard 3box reversal. In general, a reversal value of 60 for soybeans would be profitable if plotted on a scale of 2 x 3, 3 x 2, 6 x 1, or 1 x 6, where the first number is the box size and the second is the number of boxes for a reversal. By having the percentage reversal value, the box and reversal criteria can be varied in a logical manner as the prices rise or W. Using the January soybean contract, boxes can be assigned in such a way that the reversal value is close to 2.38% of the annual range (taken from Table 116). The results are the parameters shown in Table 117.

' Dunn & Hargitt Financial Services, Inc., West Lafayette, IN.

TABLE 11-6 Optimum Box and Reversal Criteria for 10Yearsl 9601969
(Davis and Thiel)

	Approximate Price Range 1960-1969	Average	Box Size	Reversal	Reversal Value	10-Year Fluctuation (%)
Wheat	113-225	169.0	1½¢	3 boxes	4½¢ = \$225	2.66
Corn	88-154	121.0	1½¢	4 boxes	6¢ = \$300	4.95
Soybeans	196-309	252.0	2¢	3 boxes	6¢ = \$300	2.38
Soybean meal	48-102	75.0	75 pts	2 boxes	150 = \$150	2.00
Soybean oil	7.3-12.3	9.8	25 pts	1 box	25 = \$150	2.55
Cattle	19-34	26.5	20 pts	2 boxes	40 = \$160	1.50
Pork bellies	18-55	36.5	25 pts	6 boxes	150 = \$540	4.10
Potatoes	1.9-8.4	5.15	5 pts	3 boxes	15 = \$75	2.91
Copper	29-52	40.5	50 pts	4 boxes	200 = \$500	4.93
Sugar	2-12	7.0	10 pts	5 boxes	54 = \$560	7.14
Cocoa	12-51	31.5	25 pts	7 boxes	175 = \$525	5.55
Silver	85-245	165.0	100 pts	2 boxes	200 = \$200	1.21

TABLE 117 Holding the Chart to a 2.38% Reversal Value*

Soybean Contract	Highest Price	Lowest Price	Annual Range	Reversal Value	Box Size
Jan 71	315	251½	63½	1½	½
Jan 72	346	284½	61½	1½	½
Jan 73	444	300	144	3½	1½
Jan 74	915	354½	560½	13½	4½
Jan 75	961	509	452	10½	3½
Jan 76	705	439½	265½	6½	2½
Jan 77	782½	490	292½	7	2½

* All values in cents.

Indexing and Logarithmic Scale

One way to transform prices into a percentage is by indexing. The steps needed to create an index can be found in Chapter 2 ("Basic Concepts"). The results of plotting a pointandfigure chart on an index will be very close to trying to create a chart with boxes that vary in price by an amount equal to a percentage, and much simpler. If boxes represent a percentage change, they can be marked 95, 96, 97103, 104.... and so forth, each box representing a 1% change in price. Because orders are placed as prices, not percentages, you will need to know the corresponding price

whenever you buy and sell.

A logarithmic scale represents a constant 2.33% change in price, equal to a proportional 0.01 logarithmic box size.' It is interesting that the results of the Davis and Thiel study determined that the optimal box size would be the equivalent of a 2.38% price change over a 10year period, remarkably close to the logarithmic equivalent.

Price Objectives Using Percentages

If the entire price series has been converted to an index, and plotted on a pointandfigure chart with percentage boxes, then the calculations for horizontal and vertical price objectives are applied to the index values in the normal manner. If prices are used instead of index values or percentages, then the price objectives must also be put into a compounded growth form. For example, a price objective of 5 boxes, each box equal to 2.33%, would be compounded (in spreadsheet notation) as:

$$\text{Objective} = 100 * ((1 + .0233)^5 - 1) = 12.20\%$$

instead of simply $5 \times .0233 = .1165$, or 11.65%.

Stock Dividends and Splits

For those applying pointandfigure charts to stocks, an adjustment must be made whenever a stock dividend is issued or the stock splits, because the chart represents the price of one share. Splits and dividends result in stock multiplying factors:

Activity	Stock Multiplication Factor
10% stock dividend	1.1
30% stock dividend	1.3
2-for-1 stock split	2.0
3-for-2 stock split	1.5

These multiplication factors can be used to correct the box size of a percentage, or logarithmic pointandfigure chart by dividing all the boxes by the multiplication factor; therefore, the new box sizes represent the value of one share.

See Luis Balleasca Loyo, "Price projections on point and figure charts," Technical Analysis of Stocks & Commodities (July 1989).

William G.S. Brown, "Logarithmic Point & Figure Charting," Tecimical Analysis of Stocks & Commodities (July 1995).

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VariableScale Comparative Results

A simple way of determining the best selection of scaling is to plot the results. The choice of equal percentage increases presented no problem. A standard pointandfigure chart was drawn with incremental price ranges assigned the necessary box size as follows:

Price range (\$/bu)	Box size (\$/bu)
240-286	2¢
286-351	2½¢
351-417	3¢
417-480	3½¢
480-544	4¢
544-598	4½¢
598-648	5¢
648-725	5½¢
725-917	6¢

Once the master chart is constructed, it will never have to be changed. if prices rise above the top of the scale, additional boxes can be

numbered with larger increments. Using the standard 3box method of charting, each January soybean futures contract was plotted in Figure 1114 and the results are shown in Table 118. The profits were consistently good except for 1976. It should be noted that the number of trades increased as the average price increased throughout the test period. This can be expected since the box size does not increase as quickly at higher prices as does the pricevolatility relationship. Because of this steady lag, the sensitivity of the system will increase noticeably at peak levels.

The size of the chart based on the pricevolatility approximation taken from Tables 113 and 114 is much smaller than the one used for equal percentage increases. Because the box sizes increase so rapidly, the formations appear more uniform at all price levels, and the number of trades occurring during each contract was reasonably constant. The results of this method show that its application to a longterm chart would be practical. Any one con~ contained only a small number of reversals and was able to generate from one to three trades (We 119).

TABLE 118 Results Using Equal Percentage
Increases (Method 2)

	Trades		Net P/L* (¢/bu)
	Total	Profitable	
January 1966	2	1	+22
January 1971	4	3	+21
January 1972	3	2	+8½
January 1973	2	1	+93%
January 1974	20	9	+23%
January 1975	12	7	+55½
January 1976	16	7	-175½
Total			+548½

* 1¢ commissions deducted.

FIGURE 11 14 Pointandfigure chart for January soybeans using
pricevolatility scaling.

Box size	Price (£/bu.)						
58	1059						
53½	1001						
50	947½						
47	897½						
44	850½						
41	816½						
38	775½						
34½	737½						
33	703						
30	670						
28½	641½						
25½	613						
23½	587½						
22	554						
20½	532½						
19	512						
17½	493						
16	475½						
14½	459½						
13½	445						
11½	417½						
10½	406						
10	394½						
8½	384½						
8	374½						
6½	366½						
6	358½						
5½	350½						
5	344						
3½	337½						
3	331						
5	326						
3½	321						
3	316						
3	311						
3	307½						
3	304						
3	301½						
3	297						
3	293½						
3	290						
2½	288						
2½	286						
2½	284						
2½	282						
2½	280						
2½	278						
2½	276						
2½	274						
2½	272						
2½	270						
2½	268						
2½	266						
2½	264						
2½	262						
2½	260						
2½	258						
2½	256						
2½	254						
2½	252						
2½	250						
		January 1971	January 1972	January 1973	January 1974	January 1975	January 1976

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TABLE 11 9 Results Using PriceVolatility Scaling

Individual Contracts	Trades		Net P/L* (£/bu)
	Total	Profitable	
January 1971	3	1	-28
January 1972	2	1	+½
January 1973	1	1	+109
January 1974	2	1	+32
January 1975	1	0	-24
January 1976	3	1	-234
Total			-144½
Continuous trading 1971-1976			
	10	5	-70

* 1½ commission deducted.

The plotted results appear to be much better than the tabulated results. This can be attributed to the increased risk at higher price levels. Although the number of boxes in a losing reversal remained small, the value of the loss increased by a factor of 25 from the bottom to the top of the chart. The few profits and losses that occur at higher price levels will be so significant in the final results that the earlier trading performance is unimportant.

Both variable box approaches offer unique possibilities for identifying trends but increase the problems of risk management. Some of these effects can be offset by reducing the invested margin as prices rise. Other techniques are discussed in Chapter 23.